

Claims

- [c1] What is claimed is:
- 1.A self-monitoring and self-correcting integrated circuit device comprising:
a self-testing controller adapted to periodically perform performance self-testing on said integrated circuit device;
a comparator adapted to evaluate whether results from said self-testing are within acceptable limits; and
a processor adapted to adjust parameters of said integrated circuit device until said results from said self-testing are within said acceptable limits.
 - [c2] 2.The integrated circuit in claim 1, wherein said performance self-testing comprises one or more of a built-in self test (BIST) unit and a functional testing unit.
 - [c3] 3.The integrated circuit in claim 2, wherein said functional testing unit is adapted to apply functional test sequences to said integrated circuit device until failure, and said comparator compares the failure frequency against predetermined limits.
 - [c4] 4.The integrated circuit in claim 1, wherein said

processor adjusts said parameters by altering the voltage supplied to portions of said integrated circuit device.

[c5] 5.The integrated circuit in claim 1, further comprising electronic fuses, wherein said processor is adapted to activate said electronic fuses to permanently change said parameters of said integrated circuit device.

[c6] 6.The integrated circuit in claim 1, wherein said processor adjusts said parameters by permanently altering the voltage produced by voltage regulators.

[c7] 7.The integrated circuit in claim 1, further comprising a permanent storage device adapted to maintain a history of adjustments made to said parameters by said processor.

[c8] 8.An autonomously self-monitoring and self-correcting integrated circuit device comprising:
a self-testing controller adapted to periodically perform performance self-testing on said integrated circuit device throughout the useful life of said integrated circuit device;
a comparator adapted to evaluate whether results from said self-testing are within acceptable limits; and
a processor adapted to permanently self-adjust parameters of said integrated circuit device until said

results from said self-testing are within said acceptable limits.

- [c9] 9.The integrated circuit in claim 8, wherein said performance self-testing comprises one or more of a built-in self test (BIST) unit and a functional testing unit.
- [c10] 10.The integrated circuit in claim 9, wherein said functional testing unit is adapted to apply functional test sequences to said integrated circuit device until failure, and said comparator compares the failure frequency against predetermined limits.
- [c11] 11.The integrated circuit in claim 8, wherein said processor adjusts said parameters by altering the voltage supplied to portions of said integrated circuit device.
- [c12] 12.The integrated circuit in claim 8, further comprising electronic fuses, wherein said processor is adapted to activate said electronic fuses to permanently change said parameters of said integrated circuit device.
- [c13] 13.The integrated circuit in claim 8, wherein said processor adjusts said parameters by permanently altering the voltage produced by voltage regulators.
- [c14] 14.The integrated circuit in claim 8, further comprising a permanent storage device adapted to maintain a history

of adjustments made to said parameters by said processor.

[c15] 15.A method of continuously monitoring and adjusting the operation of an integrated circuit device, said method comprising:

periodically performing performance testing on said integrated circuit device;

evaluating whether results from said testing are within acceptable limits; and

adjusting parameters of said integrated circuit device until said results from said testing are within said acceptable limits.

[c16] 16The method in claim 15, wherein said performance testing comprises one of built-in self testing (BIST) and functional tests.

[c17] 17.The method in claim 16, wherein said functional tests comprise looping through functional test sequences until failure, and said evaluating of said results compares the failure frequency against predetermined limits.

[c18] 18.The method in claim 15, wherein said process of adjusting said parameters comprises altering the voltage supplied to portions of said integrated circuit device.

[c19] 19.The method in claim 15, wherein said process of

adjusting said parameters comprises activating electronic fuses to permanently change said parameters of said integrated circuit device.

[c20] 20.The method in claim 15, wherein said process of adjusting said parameters comprises permanently altering the voltage produced by voltage regulators.

[c21] 21.The method in claim 15, further comprising maintaining a history of adjustments made to said parameters during said adjusting process.

[c22] 22.A method of autonomously self-monitoring and self-adjusting the operation of an integrated circuit device throughout the useful life of said integrated circuit device, said method comprising:
periodically performing performance self-testing on said integrated circuit device throughout the integrated circuit devices useful life;
evaluating whether results from said self-testing are within acceptable limits; and
self-adjusting parameters of said integrated circuit device until said results from said self-testing are within said acceptable limits.

[c23] 23The method in claim 22, wherein said performance self-testing comprises one of built-in self testing (BIST)

and functional tests.

- [c24] 24.The method in claim 23, wherein said functional tests comprise looping through functional test sequences until failure, and said evaluating of said results compares the failure frequency against predetermined limits.
- [c25] 25.The method in claim 22, wherein said process of self-adjusting said parameters comprises altering the voltage supplied to portions of said integrated circuit device.
- [c26] 26.The method in claim 22, wherein said process of self-adjusting said parameters comprises activating electronic fuses to permanently change said parameters of said integrated circuit device.
- [c27] 27.The method in claim 22, wherein said process of self-adjusting said parameters comprises permanently altering the voltage produced by voltage regulators.
- [c28] 28.The method in claim 22, further comprising maintaining a history of adjustments made to said parameters during said self-adjusting process.